

**Louisiana Department of Environmental Quality (LDEQ)  
Office of Environmental Services**

**STATEMENT OF BASIS**

**Unit 5  
Draft Initial Part 70 Permit  
Union Carbide Corporation  
Taft, St. Charles Parish, Louisiana  
Agency Interest Number: 2083  
Activity Number: PER19960014  
Draft Permit: 477-V0**

The regulatory basis for the Statement of Basis is found in 40 Code of Federal Regulations (CFR) § 70.7 Permit issuance, renewals, reopenings, and revisions, subsection (a), paragraph (5) and the Louisiana Administrative Code (LAC), Title 33, Part III. AIR. Specifically §531. Public Notice and Affected State Notice, subsection A, paragraph 4. LAC 33:III.531.A.4 states:

“The permitting authority shall provide a statement that sets forth the legal and factual basis for the proposed permit conditions of any permit issued to a Part 70 source, including references to the applicable statutory or regulatory provisions. The permitting authority shall send this statement to any person who requests it and to EPA.”

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**I. APPLICANT:**

**Company:**

Union Carbide Corporation  
P.O. Box 50  
Hahnville, LA 70057-0050

**Facility:**

Unit 5  
355 Highway 3142, Gate 28, Taft, St. Charles Parish, Louisiana  
Approximate UTM coordinates are 746.60 kilometers East and 3,319.35 kilometers North, Zone 15

**II. FACILITY AND CURRENT PERMIT STATUS:**

Union Carbide Corporation (UCC), a subsidiary of The Dow Chemical Company, operates a chemical manufacturing facility (St. Charles Operations) located on the West Bank of the Mississippi River in St. Charles Parish. The facility, which is designated "The St. Charles Operations (SCO)" is located three miles upriver from Hahnville, near Taft, Louisiana and commenced operation in 1965. One unit at the complex, Unit 5, is currently operating under State Permit No. 477(M-1) issued April 25, 1990, amended April 22, 1994, as well as State Permit Nos. 2388 and 2700. Unit 5 also operates under General Title V Permit No. 2864-V0 issued September 4, 2003 and General Title V Permit No. 2841-V0 issued April 17, 2003 and amended August 5, 2003. Other permitting activities include an Authorization to Construct/Approval to Operate dated August 27, 1998. This permit replaces all previous permitting activities. The facility submitted a timely application for the Unit 5 initial Part 70 operating permit. Unit 5 continues to operate pursuant to the "application shield" provided in the program.

Union Carbide Corporation, St. Charles Operations, produces, among many other products, ethyleneamines in an existing unit, Unit 5. Unit 5 produces ethyleneamines from the reaction of ethylene dichloride (EDC), amines and ammonia. The ethyleneamine products are separated and purified through distillation and are sent to storage tanks. Crude monoethanolamines (MEA) are loaded at tank truck loading rack EQT639/EPN 125D. Unit 5 emission sources

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In addition, the facility has several state permits that will remain effective until replaced by a Part 70 permit. These include:

Permit #	Units or Sources	Date Issued
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2446	Unit 8	12/5/1996
2657	Environmental Protection (UNOX CAP)	1/14/2000
2214	LP-6	5/2/2000
476C (M-3)	Oxide II	1/8/2001
2656 (M-2)	Olefins Distribution Unit	3/25/2003

Several Part 70 permits addressing portions of the facility have already been issued. These include:

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898-V0	Unit 6 (Ethylene Amines II)	7/3/2003
2864-V0	General Permit, (Tank, Unit 5 (Amines I))	9/4/2003
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2876-V0	Unit 9	6/7/2004
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\* Renewal application submitted

Finally, several applications for initial Part 70 permits addressing the remaining portions of the facility are still under review by the department. These include:

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Grandfathered	Acrylics 2
Grandfathered	AP-2
Grandfathered	DAP

**III. PROPOSED PERMIT / PROJECT INFORMATION:**

**Proposed Permit**

Union Carbide Corporation submitted an application and Emission Inventory Questionnaire (EIQ) for the Ethyleneamine Production Unit, Unit 5, dated October 12, 1996, and December 16, 1999. Revisions and/or updates to the application and EIQ were received on February 15, 2001, February 24, 2003, August 2, 2005 and January 25, 2006.

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**Project description**

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- Reconcile and update fugitive emissions based upon actual monitoring data and the Three Sigma Method developed by UCC
- Update storage tank emission calculations using the amine component that exhibited the highest vapor pressure at the respective storage temperature to provide Unit 5 with operational flexibility in the storage of non-TAP amines with varying compositions
- Remove the Amines Flare (EPN 131) from this permit. It is included in Part 70 Operating Permit No. 2421-V0. The flare is the backup for Unit 5 when the thermal oxidizer is off-line and receives process upset and emergency vents from Unit 5 as well as Unit 6, Unit 7, proposed Unit 10 and Site Logistics.
- Remove EIQ sheets/emissions data for storage tanks and vents routed to the Process Air Scrubber K-666 and the Unit Storage Scrubber K-667
- Add Storage Tank EQT /EPN 2010 which replaces Storage Tank EPN 118 (EPN 118 has been removed)
- Update General Condition XVII activities
- Update changes in tank throughputs, maximum pump rates, and temperatures for several emission sources

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Estimated emissions in tons per year are as follows:

Pollutant	Before	After <sup>1</sup>	Change
PM <sub>10</sub>	0.08	0.15	+ 0.07
SO <sub>2</sub>	NS	0.01	+ 0.01
NO <sub>x</sub>	15.99	20.42	+ 4.43
CO	4.87	6.21	+ 1.34
VOC*	25.43	28.94	+ 3.51

\*VOC LAC 33:III Chapter 51 Toxic Air Pollutants (TAPs):

Pollutant	Before <sup>1</sup>	After <sup>1</sup>	Change
Biphenyl	NS	0.39	+0.39
Ethylene Dichloride	NS	1.06	+1.06
Vinyl chloride	0.33	0.49	+0.16
Total	0.33	1.94	+1.61

\*Other VOC (TPY): 27.00

Non-VOC LAC 33:III Chapter 51 Toxic Air Pollutants (TAPs):

Pollutant	Before <sup>1</sup>	After <sup>1</sup>	Change
Ammonia	<0.01	1.03	+1.03
Hydrochloric Acid	3.50	4.45	+0.95
Chlorine	7.88	10.07	+2.19
Total	11.38	15.55	+ 4.17

<sup>1</sup>The before emissions represent emissions that were grandfathered and not previously speciated ( indicated as "NS"), or accounted for.

<sup>2</sup>The after emissions represent speciation of pollutants, updated emission factors, and improved calculation methodology.

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**Prevention of Significant Deterioration (PSD) Applicability**

PSD analysis was not required since there were no significant increases in emissions or change in methodology.

**MACT Requirements**

The UCC St. Charles Operations is a major source of toxic air pollutants (TAPs) pursuant to LAC 33:III.Chapter 51. Unit 5 emits the following TAPs: ammonia, biphenyl, chlorine, ethylene dichloride, hydrochloric acid, and vinyl chloride. All of the TAPs above, except for ethylene dichloride, biphenyl and vinyl chloride, are either Class III or Supplemental TAPs, and must comply with the applicable provisions of LAC 33:III.Chapter 51.

Emission sources of Class I or II TAPs emitted at a rate over the Minimum Emission Rate (MER), established in LAC 33:III.5112, require Maximum Achievable Control Technology (MACT). Ethylene dichloride and biphenyl, Class II TAPs, are emitted from sources in Unit 5 at a rate above the MER; these sources will comply with MACT requirements by complying with applicable 40 CFR 63, Subpart FFFF, NESHAP for Miscellaneous Organic Chemical Manufacturing (MON) requirements. Vinyl chloride, a Class I TAP, is emitted from the ammonia absorber vent at a rate above its MER; a thermal oxidizer is used to control the vinyl chloride emissions and is considered MACT for this pollutant. In addition, when the thermal oxidizer is offline, the flare EQT240 /EPN113 serves as backup. The flare meets MACT requirements.

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**Air Modeling Analysis**

Dispersion Model(s) Used: ISCST3

Pollutant	Time Period	Calculated Maximum Ground Level Concentration	Louisiana Air Quality Standard (NAAQS)
HCl	8 Hour Avg.	75.1 $\mu\text{g}/\text{m}^3$	180 $\mu\text{g}/\text{m}^3$
Vinyl Chloride	Annual Avg.	0.017 $\mu\text{g}/\text{m}^3$	1.19 $\mu\text{g}/\text{m}^3$

**General Condition XVII Activities**

The facility will comply with the applicable General Condition XVII Activities emissions as required by the operating permit rule. However, General Condition XVII Activities are not subject to testing, monitoring, reporting or recordkeeping requirements. For a list of approved General Condition XVII Activities, refer to Section VIII of the draft Part 70 permit. These releases are small and will have an insignificant impact on air quality.

**Insignificant Activities**

None.

**Regulatory Analysis**

The applicability of the appropriate regulations is straightforward and provided in the Facility Specific Requirements Section of the draft permit, or where provided, Tables X and XI of the draft permit. Similarly, the Monitoring, Reporting and Recordkeeping necessary to demonstrate compliance with the applicable terms, conditions and standards are provided in the Facility Specific Requirements Section of the draft permit, or where provided, Tables X and XI of the draft permit.



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**IV. PERMIT SHIELD**

A permit shield is not a part of this draft permit.

**V. PERIODIC MONITORING**

The Monitoring, Reporting and Recordkeeping necessary to demonstrate compliance with the applicable terms, conditions and standards are provided in the Facility Specific Requirements Section of the proposed permit.

Compliance Assurance Monitoring (CAM), 40 CFR 64, is applicable to the facility, however CAM is not part of this initial Part 70 operating permit because Unit 5 does not have any emission units with a potential to emit greater than or equal to 100% of the major threshold, before taking controls (pre-control device) into account, as part of this initial Part 70 Operating Permit

**VI. APPLICABILITY AND EXEMPTIONS OF SELECTED SUBJECT ITEMS**

The applicability or exemption of selected subject items are provided in Section XI of the draft Part 70 operating permit.

<b>VII. STREAMLINED REQUIREMENTS</b>			
<b>Unit or Plant Site</b>	<b>Programs Being Streamlined</b>	<b>Stream Applicability</b>	<b>Overall Most Stringent Program</b>
<b>Unit 5</b>	LAC 33:III.2121	Streams containing 10% VOC	LA Non-HON MACT**
	LA Non-HON MACT	Streams containing 5% VOHAP	

\*\*Unit 5 must comply with 40 CFR 63 Subpart FFFF (MON), as promulgated

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**VIII. GLOSSARY**

Best Available Control Technologies (BACT) - An emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under this part which would be emitted from any proposed major stationary source or major modification which the administrative authority, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such pollutant.

Carbon Monoxide (CO) – A colorless, odorless gas which is an oxide of carbon.

Grandfathered Status - Those facilities that were under actual construction or operation as of June 19, 1969, the signature date of the original Clean Air Act. These facilities are not required to obtain a permit. Facilities that are subject to Part 70 (Title V) requirements lose grandfathered status and must apply for a permit.

Hydrogen Disulfide (H<sub>2</sub>S) - A colorless inflammable gas having the characteristic odor of rotten eggs, and found in many mineral springs. It is produced by the action of acids on metallic sulfides, and is an important chemical reagent.

Maximum Achievable Control Technology (MACT) - The maximum degree of reduction in emissions of each air pollutant subject to LAC 33:III.Chapter 51 (including a prohibition on such emissions, where achievable) that the administrative authority, upon review of submitted MACT compliance plans and other relevant information and taking into consideration the cost of achieving such emission reduction, as well as any non-air-quality health and environmental impacts and energy requirements, determines is achievable through application of measures, processes, methods, systems, or techniques.

New Source Review (NSR) - A preconstruction review and permitting program applicable to new or modified major stationary sources of air pollutants regulated under the Clean Air Act (CAA). NSR is required by Parts C ("Prevention of Significant Deterioration of Air Quality") and D ("Nonattainment New Source Review").

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Nitrogen Oxides (NO<sub>x</sub>) - Compounds whose molecules consists of nitrogen and oxygen.

Organic Compound - Any compound of carbon and another element. Examples: Methane (CH<sub>4</sub>), Ethane (C<sub>2</sub>H<sub>6</sub>), Carbon Disulfide (CS<sub>2</sub>)

Part 70 Operating Permit - Also referred to as a Title V permit, required for major sources as defined in 40 CFR 70 and LAC 33:III.507. Major sources include, but are not limited to, sources which have the potential to emit:  $\geq 10$  tons per year of any toxic air pollutant;  $\geq 25$  tons of total toxic air pollutants; and  $\geq 100$  tons per year of regulated pollutants (unless regulated solely under 112(r) of the Clean Air Act) (25 tons per year for sources in non-attainment parishes).

PM<sub>10</sub>- Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers as measured by the method in Title 40, Code of Federal Regulations, Part 50, Appendix J.

Potential to Emit (PTE) - The maximum capacity of a stationary source to emit any air pollutant under its physical and operational design.

Prevention of Significant Deterioration (PSD) - A New Source Review permitting program for major sources in geographic areas that meet the National Ambient Air Quality Standards (NAAQS) at 40 CFR Part 50. PSD requirements are designed to ensure that the air quality in attainment areas will not degrade.

Sulfur Dioxide (SO<sub>2</sub>) - An oxide of sulfur.

Title V permit - See Part 70 Operating Permit.

Volatile Organic Compound (VOC) - Any organic compound which participates in atmospheric photochemical reactions; that is, any organic compound other than those which the administrator of the U.S. Environmental Protection Agency designates as having negligible photochemical reactivity.

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- Update General Condition XVII activities
- Update changes in tank throughputs, maximum pump rates, and temperatures for several emission sources

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**Agency Interest Number: 2083**  
**Activity Number: PER19960014**  
**Draft Permit: 477-V0**

Estimated emissions in tons per year are as follows:

Pollutant	Before	After <sup>1</sup>	Change
PM <sub>10</sub>	0.08	0.15	+ 0.07
SO <sub>2</sub>	NS	0.01	+ 0.01
NO <sub>x</sub>	15.99	20.42	+ 4.43
CO	4.87	6.21	+ 1.34
VOC*	25.43	28.94	+ 3.51

\*VOC LAC 33:III Chapter 51 Toxic Air Pollutants (TAPs):

Pollutant	Before <sup>1</sup>	After <sup>1</sup>	Change
Biphenyl	NS	0.39	+0.39
Ethylene Dichloride	NS	1.06	+1.06
Vinyl chloride	0.33	0.49	+0.16
Total	0.33	1.94	+1.61

\*Other VOC (TPY): 27.00

Non-VOC LAC 33:III Chapter 51 Toxic Air Pollutants (TAPs):

Pollutant	Before <sup>1</sup>	After <sup>1</sup>	Change
Ammonia	<0.01	1.03	+1.03
Hydrochloric Acid	3.50	4.45	+0.95
Chlorine	7.88	10.07	+2.19
Total	11.38	15.55	+ 4.17

<sup>1</sup>The before emissions represent emissions that were grandfathered and not previously speciated ( indicated as "NS"), or accounted for.

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<sup>2</sup>The after emissions represent speciation of pollutants, updated emission factors, and improved calculation methodology.

**Prevention of Significant Deterioration (PSD) Applicability**

PSD analysis was not required since there were no significant increases in emissions or change in methodology.

**MACT Requirements**

The UCC St. Charles Operations is a major source of toxic air pollutants (TAPs) pursuant to LAC 33:III.Chapter 51. Unit 5 emits the following TAPs: ammonia, biphenyl, chlorine, ethylene dichloride, hydrochloric acid, and vinyl chloride. All of the TAPs above, except for ethylene dichloride, biphenyl and vinyl chloride, are either Class III or Supplemental TAPs, and must comply with the applicable provisions of LAC 33:III.Chapter 51.

Emission sources of Class I or II TAPs emitted at a rate over the Minimum Emission Rate (MER), established in LAC 33:III.5112, require Maximum Achievable Control Technology (MACT). Ethylene dichloride and biphenyl, Class II TAPs, are emitted from sources in Unit 5 at a rate above the MER; these sources will comply with MACT requirements by complying with applicable 40 CFR 63, Subpart FFFF, NESHAP for Miscellaneous Organic Chemical Manufacturing (MON) requirements. Vinyl chloride, a Class I TAP, is emitted from the ammonia absorber vent at a rate above its MER; a thermal oxidizer is used to control the vinyl chloride emissions and is considered MACT for this pollutant. In addition, when the thermal oxidizer is offline, the flare EQT240 /EPN131 serves as backup. The flare meets MACT requirements.

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**Air Modeling Analysis**

Dispersion Model(s) Used: ISCST3

Pollutant	Time Period	Calculated Maximum Ground Level Concentration	Louisiana Air Quality Standard (NAAQS)
HCl	8 Hour Avg.	75.1 $\mu\text{g}/\text{m}^3$	180 $\mu\text{g}/\text{m}^3$
Vinyl Chloride	Annual Avg.	0.017 $\mu\text{g}/\text{m}^3$	1.19 $\mu\text{g}/\text{m}^3$

**General Condition XVII Activities**

The facility will comply with the applicable General Condition XVII Activities emissions as required by the operating permit rule. However, General Condition XVII Activities are not subject to testing, monitoring, reporting or recordkeeping requirements. For a list of approved General Condition XVII Activities, refer to Section VIII of the draft Part 70 permit. These releases are small and will have an insignificant impact on air quality.

**Insignificant Activities**

None.

**Regulatory Analysis**

The applicability of the appropriate regulations is straightforward and provided in the Facility Specific Requirements Section of the draft permit, or where provided, Tables X and XI of the draft permit. Similarly, the Monitoring, Reporting and

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Recordkeeping necessary to demonstrate compliance with the applicable terms, conditions and standards are provided in the Facility Specific Requirements Section of the draft permit, or where provided, Tables X and XI of the draft permit.

**IV. PERMIT SHIELD**

A permit shield is not a part of this draft permit.

**V. PERIODIC MONITORING**

The Monitoring, Reporting and Recordkeeping necessary to demonstrate compliance with the applicable terms, conditions and standards are provided in the Facility Specific Requirements Section of the proposed permit.

Compliance Assurance Monitoring (CAM), 40 CFR 64, is applicable to the facility, however CAM is not part of this initial Part 70 operating permit because Unit 5 does not have any emission units with a potential to emit greater than or equal to 100% of the major threshold, before taking controls (pre-control device) into account, as part of this initial Part 70 Operating Permit

**VI. APPLICABILITY AND EXEMPTIONS OF SELECTED SUBJECT ITEMS**

The applicability or exemption of selected subject items are provided in Section XI of the draft Part 70 operating permit.

<b>VII. STREAMLINED REQUIREMENTS</b>			
<b>Unit or Plant Site</b>	<b>Programs Being Streamlined</b>	<b>Stream Applicability</b>	<b>Overall Most Stringent Program</b>
<b>Unit 5</b>	LAC 33:III.2121	Streams containing 10% VOC	LA Non-HON MACT**

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VII. STREAMLINED REQUIREMENTS			
Unit or Plant Site	Programs Being Streamlined	Stream Applicability	Overall Most Stringent Program
	LA Non-HON MACT	Streams containing 5% VOHAP	

\*\*Unit 5 must comply with 40 CFR 63 Subpart FFFF (MON), as promulgated

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**VIII. GLOSSARY**

Best Available Control Technologies (BACT) - An emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under this part which would be emitted from any proposed major stationary source or major modification which the administrative authority, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such pollutant.

Carbon Monoxide (CO) – A colorless, odorless gas which is an oxide of carbon.

Grandfathered Status - Those facilities that were under actual construction or operation as of June 19, 1969, the signature date of the original Clean Air Act. These facilities are not required to obtain a permit. Facilities that are subject to Part 70 (Title V) requirements lose grandfathered status and must apply for a permit.

Hydrogen Disulfide (H<sub>2</sub>S) - A colorless inflammable gas having the characteristic odor of rotten eggs, and found in many mineral springs. It is produced by the action of acids on metallic sulfides, and is an important chemical reagent.

Maximum Achievable Control Technology (MACT) - The maximum degree of reduction in emissions of each air pollutant subject to LAC 33:III.Chapter 51 (including a prohibition on such emissions, where achievable) that the administrative authority, upon review of submitted MACT compliance plans and other relevant information and taking into consideration the cost of achieving such emission reduction, as well as any non-air-quality health and environmental impacts and energy requirements, determines is achievable through application of measures, processes, methods, systems, or techniques.

New Source Review (NSR) - A preconstruction review and permitting program applicable to new or modified major stationary sources of air pollutants regulated under the Clean Air Act (CAA). NSR is required by Parts C ("Prevention of Significant Deterioration of Air Quality") and D ("Nonattainment New Source Review").

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Nitrogen Oxides (NO<sub>x</sub>) - Compounds whose molecules consists of nitrogen and oxygen.

Organic Compound - Any compound of carbon and another element. Examples: Methane (CH<sub>4</sub>), Ethane (C<sub>2</sub>H<sub>6</sub>), Carbon Disulfide (CS<sub>2</sub>)

Part 70 Operating Permit - Also referred to as a Title V permit, required for major sources as defined in 40 CFR 70 and LAC 33:III.507. Major sources include, but are not limited to, sources which have the potential to emit:  $\geq 10$  tons per year of any toxic air pollutant;  $\geq 25$  tons of total toxic air pollutants; and  $\geq 100$  tons per year of regulated pollutants (unless regulated solely under 112(r) of the Clean Air Act) (25 tons per year for sources in non-attainment parishes).

PM<sub>10</sub>- Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers as measured by the method in Title 40, Code of Federal Regulations, Part 50, Appendix J.

Potential to Emit (PTE) - The maximum capacity of a stationary source to emit any air pollutant under its physical and operational design.

Prevention of Significant Deterioration (PSD) – A New Source Review permitting program for major sources in geographic areas that meet the National Ambient Air Quality Standards (NAAQS) at 40 CFR Part 50. PSD requirements are designed to ensure that the air quality in attainment areas will not degrade.

Sulfur Dioxide (SO<sub>2</sub>) – An oxide of sulfur.

Title V permit – See Part 70 Operating Permit.

Volatile Organic Compound (VOC) - Any organic compound which participates in atmospheric photochemical reactions; that is, any organic compound other than those which the administrator of the U.S. Environmental Protection Agency designates as having negligible photochemical reactivity.